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CURRENT LITERATURE.

BOOK REVIEWS.

A college botany.

PROFESSOR ATKINSON¹ has revised and elaborated his *Elementary Botany* for college use. An elementary college text that includes all of the great divisions of botany seems to be in demand, at least according to the judgment of publishers. Perhaps the demand is both true and just, but it is a large one to make of a single author, who is supposed to be, from the college standpoint, either a morphologist, a physiologist, or an ecologist. One looks for inequality of grasp under such circumstances, unless the presentation is so elementary that it hardly belongs to a modern college course.

In spite of this disadvantage, Professor ATKINSON has covered the whole general field in a way that indicates an unusually wide familiarity with the various divisions of the subject. The parts dealing with physiology and morphology are largely elaborations of the same parts in the elementary text, introducing the new material suited to more advanced students and bringing certain parts up to date. The part dealing with ecology, however, has been entirely reorganized, and represents the first presentation of ecology in an American textbook from the college standpoint.

In the organization of the text, part one (pp. 135) deals with physiology, part two (pp. 207) with morphology, part three (pp. 115) with the ecology of plant members, part four (pp. 184) with plant associations, and part five (pp. 65) with representative families of Angiosperms. The space given to the different parts represents a balance unusually well-maintained for books of this type. There is always a temptation to overdo the part in which the author is especially interested.

Professor ATKINSON believes in numerous and good illustrations, with as many of them original as possible; and hence the volume is full of fresh and suggestive illustrations, and should be of great service to college classes in elementary botany.—J. M. C.

Handbook of plant morphology.

The friends of ARTHUR, BARNES, and COULTER'S *Handbook of Plant Dissection*, published in 1886, will be glad to know that this helpful laboratory guide has been rewritten, thus bringing it again in touch with the best methods of elementary instruction. The authors have delegated the revision to other hands, and both for this reason and on account of changes necessitated by recent developments in botany, it is perhaps fitting that the new edition should appear under

¹ ATKINSON, GEORGE FRANCIS, A college text-book of botany. pp. xvi + 737. figs. 592. New York: Henry Holt & Co. 1905. \$2.00.

a different title.¹ The most important change noted is the increased number of types discussed, and the presentation of these in a connected account. In harmony with this plan many unrelated details, especially concerning the vegetative structure of the higher plants, are omitted. Though the number of forms discussed is increased from eleven to twenty-five, the size of the book is reduced, having three-fourths the number of pages in *Plant Dissection*. The types selected illustrate very well the probable steps in the evolution of plants, and the discussions are exceedingly clear and suggestive. It seems to the reviewer, however, that the introduction of a heterogamous confervoid form might have strengthened the presentation of the subject of heterogamy among the algae. So long as teachers have too large classes and too little time for purely inductive study in the laboratory, some form of written direction seems indispensable. *Plant Morphology* meets this demand in a most helpful way. A possible danger may lie in its excellence, in that weak teachers may depend upon it too fully and neglect the personal relation which should accompany laboratory study of this character.

—R. B. WYLIE.

NOTES FOR STUDENTS.

ALLEN² has recently published in full the results of his study of nuclear division in the pollen mother-cells of *Lilium canadense*, following the preliminary announcement which appeared last year.³ This paper is of especial interest in relation to the final paper of FARMER and MOORE on the reduction divisions in animals and plants, since ALLEN reaches fundamentally different conclusions as to the events of synapsis and the preparations for the heterotypic mitosis. As FARMER and MOORE also studied a species of *Lilium* (*L. candidum*), it seems hardly possible that both accounts can be correct, so that the line separating the two schools is sharply drawn in these accounts of a similar form. One school is led by FARMER and MOORE, and finds support in STRASBURGER's recent paper *Ueber reduktionsteilung* (1904), and in the recent work of GREGORY on the leptosporangiate ferns, and of WILLIAMS on *Dictyota*. With ALLEN are associated in the chief point of dispute (the formation of the bivalent chromosomes of the heterotypic mitosis) the botanists of the Carnoy Institute, GREGOIRE and BERGHS, and also ROSENBERG.

ALLEN'S account is chiefly remarkable for the detailed study of the events preceding and following synapsis, which are presented in greater detail than in any previous investigation. The nucleus of the young pollen mother-cell contains a network of large irregular masses, derived from the chromosomes of the preceding mitosis in the archesporium, and connected by fibers. As the nucleus increases in size, the chromatin knots become widely separated, and the nucleoli

¹ CALDWELL, O. W., *Handbook of Plant Morphology*. 12mo. pp. viii + 190. New York: Henry Holt & Co. 1904.

² ALLEN, C. E., Nuclear division in the pollen mother-cells of *Lilium canadense*. *Annals of Botany* 19:189-258. *pls. 6-9.* 1905.

³ BOTANICAL GAZETTE 37:464. 1894.